# Post Successful Fibrinolytic Inferoposterior St-Elevation Myocardial Infarction in Gianyar, Bali: A Case Report

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**Abstract:** **Background**: ST-elevation myocardial infarction (STEMI) is a life-threatening medical emergency characterized by complete occlusion of a coronary artery, leading to myocardial ischemia and subsequent tissue damage. Over the years, significant advancements have been made in the diagnosis and management of this condition, resulting in improved outcomes. **Case illustration**: A 51-year-old man presented to the emergency department with a chief complaint of chest pain like being crushed by a heavy object since two hours before admission, not relieved by rest. Electrocardiograph (ECG) examination showed ST-elevation in leads III and avF, and ST depression in leads V2-V6 indicating acute myocardial infarction in the inferior and posterior areas. Fibrinolytic was administered to the patient with streptokinase 1,500,000 units in 1 hour. Durante and post fibrinolytic electrocardiograph examinations were performed, and ST waves were found to decrease in leads II and avF and ST depression waves were reduced in leads V2-V6 The patient had no complaints on the third day of hospitalization. Patient diagnosed with Inferoposterior STEMI post successful fibrinolytic. **Discussion:** Fibrinolytic therapy aims to restore coronary blood flow by dissolving thrombi responsible for coronary artery occlusion. Fibrinolytic therapy should be started as soon as feasible for best benefits; ideally, this means during the first three to six hours and maybe up to twelve hours after the onset of symptoms. The administration of fibrinolytics in this case resulted in successful reperfusion of the occluded coronary artery, as evidenced by the resolution of ST-segment elevation on subsequent ECGs. **Conclusions**: Although primary PCI is considered the gold standard treatment for STEMI, fibrinolytic therapy remains a viable and potentially life-saving alternative, particularly in settings where immediate invasive interventions are not readily accessible.

**Keyword:** STEMI, Fibrinolytic, Myocardial Infarction, Acute Coronary Syndrome

## INTRODUCTION

ST-Elevation Myocardial Infarction (STEMI) is a life-threatening medical emergency characterized by complete occlusion of a coronary artery, leading to myocardial ischemia and subsequent tissue damage. In Indonesia, Coronary Heart Disease (CHD) death came in second place among all causes of death in 2019 (C. Abbafati et al, 2020). In Indonesia, the prevalence of ACS with ST-elevation has also risen by 15% in recent years (Linder, 2022). In addition to

increasing mortality, an ACS episode is linked to a high rate of hospital stays; in fact, thirty percent of patients who are discharged are readmitted within six months (Daniel, 2024). An estimated $177 billion in major economic losses are expected as a result of this load (Permenkes, 2024) Over the years, significant advancements have been made in the diagnosis and management of this condition, resulting in improved outcomes. This case report of a 51 years old male patient with Inferoposterior STEMI that successfully treated with fibrinolytic, aims to elucidate a presentation of STEMI, highlighting the diagnostic and the subsequent complexities in managing the patient.

## CASE PRESENTATION

A 51-year-old man presented to the emergency department with a chief complaint of chest pain like being crushed by a heavy object since two hours before admission, not relieved by rest. The patient also had diaphoresis, no nausea, vomiting or tightness. The patient has a smoking habit since 15 years ago. There was no history of stroke or previous surgery. The patient also stated that he had never checked his blood pressure and blood sugar. None of the patient's relatives had similar complaints before.

On arrival at the hospital, the patient was conscious compos mentis, with Glasgow Coma Scale (GCS) E4V5M6. Vital signs were within normal limits except blood pressure 162/95 mmHg, heart rate 91 times/minute, respiratory rate 23 times/minute, temperature 36.3$^{o}$C, and oxygen saturation 97% free water. Physical examination found no abnormality of the head and neck, symmetrical chest, single heart sound, no murmur, no palpable thrill, abdomen within normal limits, no palpable pulsation of the abdominal aorta, the patient's extremities palpable cold.

Electrocardiograph (ECG) examination showed ST-elevation in leads III and avF, and ST depression in leads V2-V6 indicating acute myocardial infarction in the inferior and posterior areas (**Fig.1**). CBC examination found no abnormalities, Hb 16.5 g/dL, WBC 7,760/uL, Platelet 263,000/uL, clinical chemistry examination within normal limits, electrolyte examination within normal limits, blood sugar 142 mg/dL, creatinine 0.71 mg/dL, CKMB 33.00 U/L, Troponin I 5920 ng/L. Chest X-Ray examination did not show any abnormalities. No echocardiography examination was obtained. Patient diagnosed with Inferoposterior STEMI.

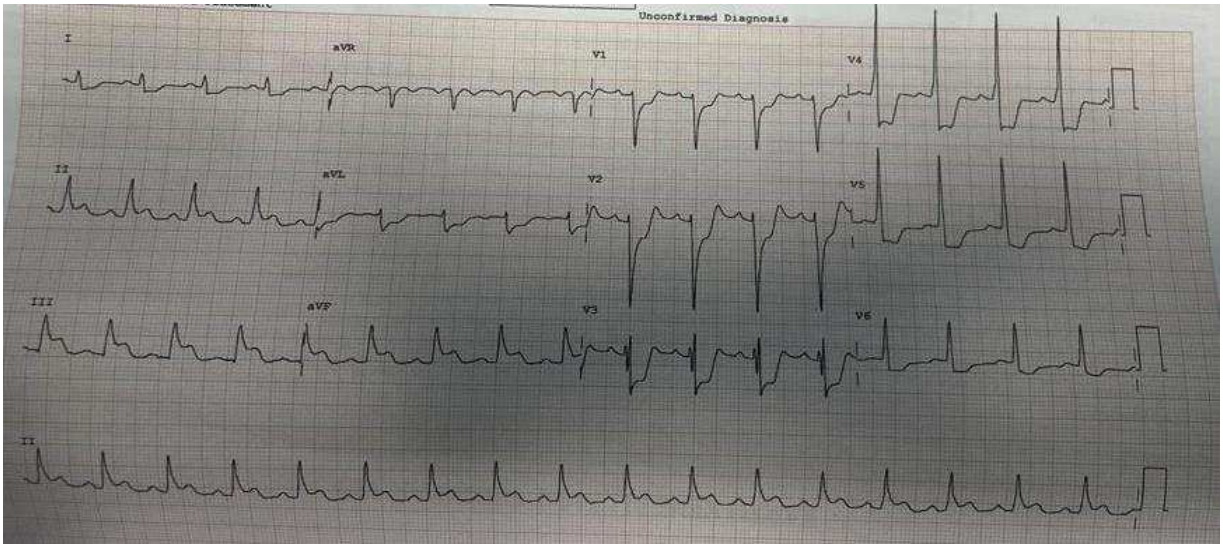


**Figure 1.** Electrocardiograph (ECG) of the patient upon arrival at the emergency department

Fibrinolytic was administered to the patient with streptokinase 1,500,000 units in 1 hour. The patient was also given double antiplatelet loading using aspirin 160mg and clopidogrel 300mg. bisoprolol 2.5mg, atorvastatin 20mg, enoxaparin 0.3cc intravenously, diazepam 5mg, isosorbide dinitrate drip 2 mg per hour, ramipril 2.5mg, lansoprazole 30 mg intravenously. Durante and post fibrinolytic electrocardiograph examinations were performed, and ST waves were found to decrease in leads II and avF and ST depression waves were reduced in leads V2-V6 on ECG durante fibrinolytic (Fig 2.). Posterior Electrocardiograp, ST elevatin in Lead V8. (Fig 3). Right Electrocardiograph (ECG) normal finding in all V1R-V6R (Fig 4.). In evaluating the patient's complaints, the patient said that the chest pain had decreased, only felt uncomfortable, there was no nausea, vomiting, tightness, and diaphoresis.

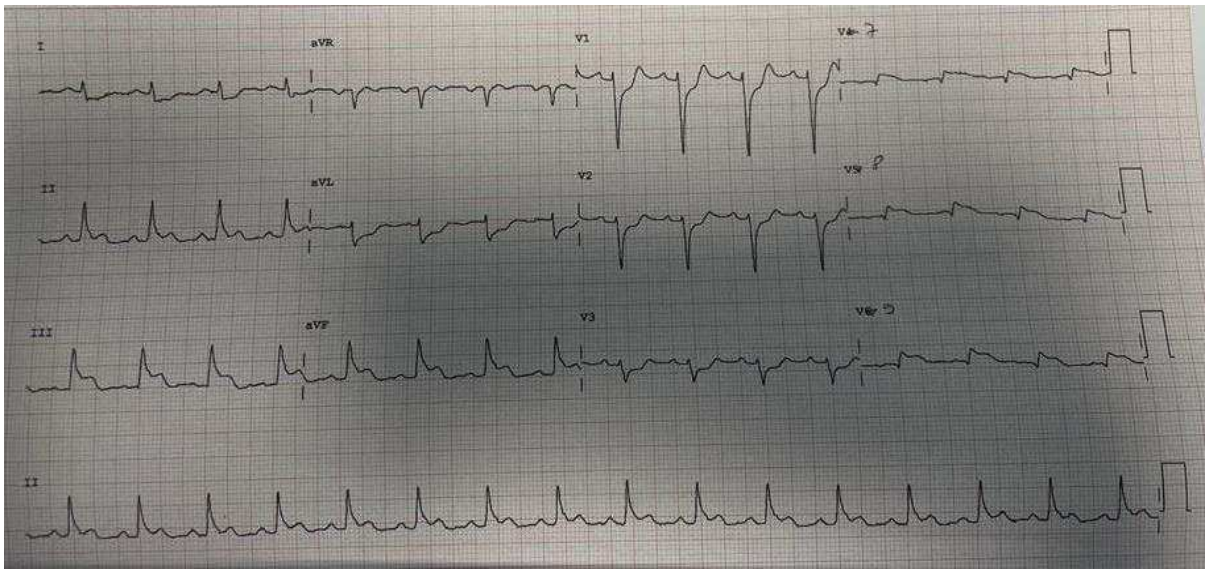

**Figure 2.** Posterior Electrocardiograph (ECG) of the patient upon arrival at the emergency department

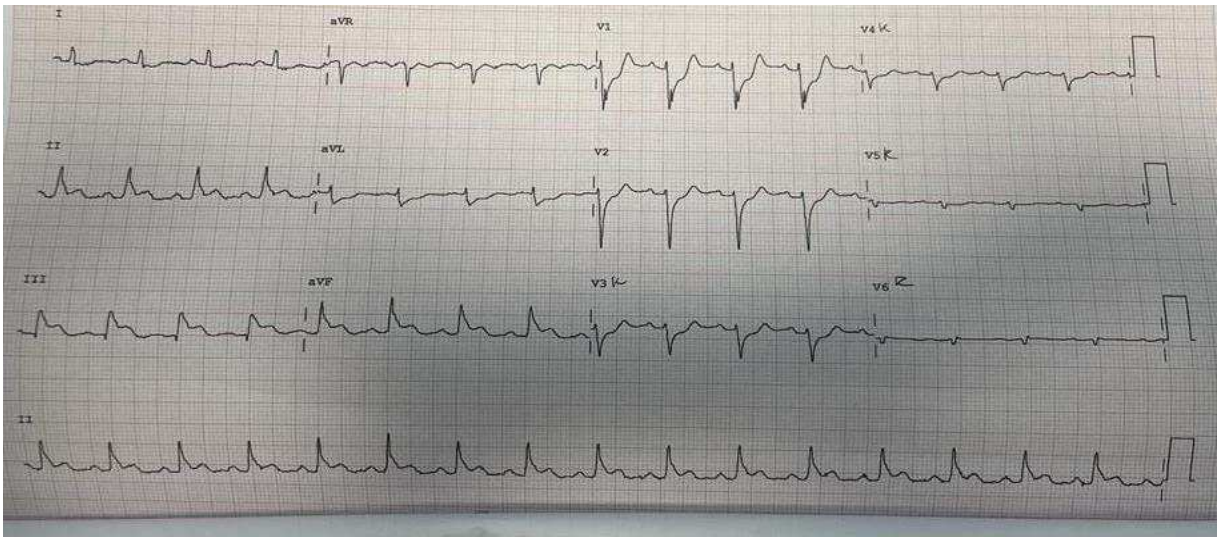


**Figure 3.** Right Electrocardiograph (ECG) of the patient upon arrival at the emergency department

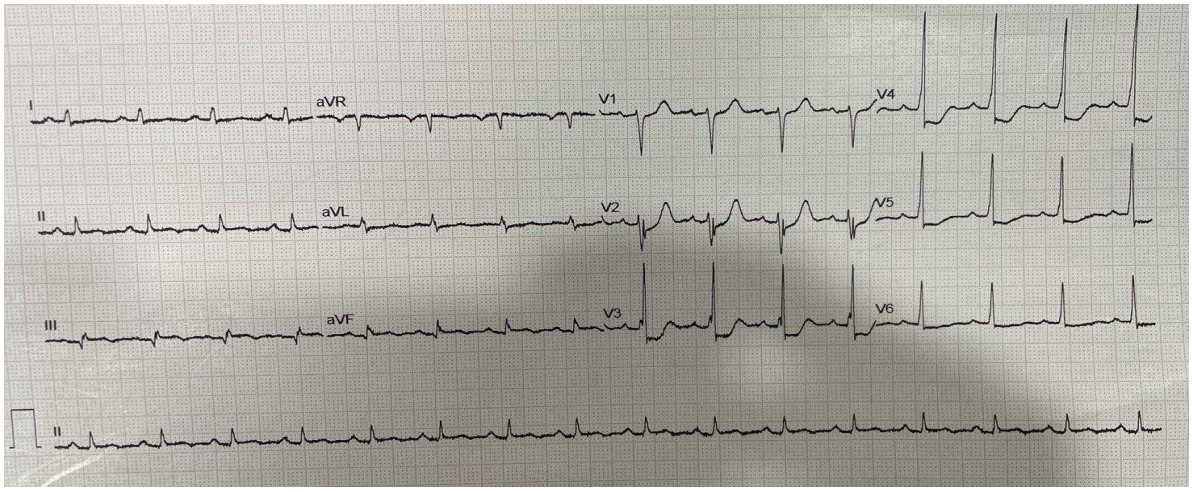


**Figure 4.** Electrocardiograph (ECG) of the patient post fibrinolytic

Follow-up was conducted on the patient in the inpatient room, on the second day, the patient still had complaints of chest discomfort, no nausea, vomiting, tightness, and diaphoresis. The patient's vital signs were within normal limits. The patient had no complaints on the third day of hospitalization. Treatment was continued and the patient could be discharged from the hospital on the fourth day of treatment and continued for control at the outpatient installation.

## DISCUSSION

The presented case report highlights a successful management approach for ST-elevation myocardial infarction (STEMI) in the inferoposterior region utilizing fibrinolytic therapy. STEMI occurring in the inferoposterior territory is relatively less common compared to anterior or lateral wall involvement. The timely administration of fibrinolytic agents remains a widely accepted treatment strategy for patients with STEMI, particularly in resource-limited settings where immediate invasive interventions like percutaneous coronary intervention (PCI) may not be readily available.

Achieving early, full epicardial and microvascular reperfusion is the cornerstone of therapy for ST-segment-elevation myocardial infarction (STEMI) in order to reduce the size of the infarct. According to US and European guidelines, primary percutaneous coronary intervention (pPCI) is currently the preferred method of reperfusion when done promptly by a skilled team. This is because pPCI reduces the risk of intracranial hemorrhage (ICH) and improves survival when compared to fibrinolytic therapy (Keeley, Boura, Grines, 2003). When pPCI cannot be administered quickly, however, there is a sharp incremental increase in mortality, especially when there are delays of more than 60 minutes between first medical contact and PCI (Scholz et al, 2018)

Nearly three-quarters of acute myocardial infarctions are still treated with fibrinolytic-based reperfusion in low- and middle-income nations (Chatterjee and Giri, 2017) (Chandrashekhar et al, 2020). It is frequently challenging to meet the time goals recommended by the American College of Cardiology/American Heart Association and the European Society of Cardiology guidelines, even in high-income countries. Only 25 to 50 percent of STEMI patients who are transferred for pPCI reach the first medical contact-to-balloon time of less than 120 minutes (Vora et al, 2015), (Aliprandi costa, 2016) (Puymirat et al, 2013) (Puymirat et al, 2017) When fast delivery of pPCI is not possible, the benefits of fibrinolytic treatment, which can reduce the contact-to-reperfusion period, should not be disregarded. Furthermore, for the best results, total ischemia time should be taken into account rather than just door-to-balloon durations.

In this case, the patient presented with characteristic symptoms of acute myocardial infarction, including severe chest pain radiating to the left arm and diaphoresis. Electrocardiogram (ECG) findings demonstrated ST-segment elevation and reciprocal changes in the inferior leads along with posterior leads, confirming the diagnosis of STEMI inferoposterior. Due to the absence of contraindications, the decision was made to administer fibrinolytics promptly.

Fibrinolytic therapy aims to restore coronary blood flow by dissolving thrombi responsible for coronary artery occlusion. Fibrinolytic therapy should be started as soon as feasible for best benefits; ideally, this means during the first three to six hours and maybe up to twelve hours after the onset of symptoms (FTT, 1994) (Boersma, 1996). Three hours after the onset of symptoms, fibrinolysis no longer provides the same therapeutic benefit (Pinto, 2011). For pPCI, there is likewise a reduced benefit with treatment delays; however, compared to fibrinolysis, PCI may not require as careful consideration in treatment time for myocardial salvage (Brodie, 2007). Since the

efficacy of fibrinolytic therapy has not been proven, it is not recommended to routinely administer it to patients who present more than 12 hours after the onset of symptoms (FTT, 1994). After more than 12 hours, fibrinolytic therapy might make sense in certain situations, including when a patient presents with a STEMI, stutters with chest discomfort, and there is still evidence of ischemia.

Compared to streptokinase, the fibrin-specific medications alteplase (accelerated infusion), reteplase, and TNK have a better efficacy and a manageable risk profile (Jinatongthai et al, 2017) The most often used fibrinolytic agent in the world is still nonfibrin-specific streptokinase, which is less effective but less expensive (Kumbhani, 2017). Since streptokinase is a non-specific agent, it activates plasminogen that is both free and linked to fibrin, producing unopposed plasmin and causing fibrinogen and other clotting components to degrade, resulting in a systemic lytic state. Streptokinase may be more likely to activate platelets when used in conjunction with fibrin-specific medicines as part of a pharmacoinvasive strategy, according to observational studies rather than randomized controlled trials (Raja et al, 2017). But in this case, we use streptokinase due to availability of drugs at the hospital.

The administration of fibrinolytics in this case resulted in successful reperfusion of the occluded coronary artery, as evidenced by the resolution of ST-segment elevation on subsequent ECGs. The patient's symptoms also improved significantly, with relief of chest pain and resolution of diaphoresis. Close monitoring of the patient's vital signs, ECG changes, and laboratory parameters, such as cardiac enzymes, is crucial following fibrinolytic therapy to assess for any adverse events or reocclusion.

It is important to acknowledge that fibrinolytic therapy may carry potential risks, including bleeding complications, intracranial hemorrhage, or reocclusion of the coronary artery despite initial successful reperfusion. Therefore, careful patient selection based on established guidelines and risk-benefit assessment is essential.

## CONCLUSION

In summary, this case report underscores the effectiveness of fibrinolytic therapy in achieving successful reperfusion and clinical improvement in patients with STEMI in the inferoposterior territory. Although primary PCI is considered the gold standard treatment for STEMI, fibrinolytic therapy remains a viable and potentially life-saving alternative, particularly in settings where immediate invasive interventions are not readily accessible. Further research and larger clinical trials are warranted to optimize the use of fibrinolytics in specific subsets of STEMI patients and refine treatment protocols to enhance outcomes in these cases.

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